

Pharmaceuticals in Drinking Water

Compiled by Patricia Reichert, December 2010

www.legis.wisconsin.gov/lrb/pubs/tapthepower.htm

Pharmaceuticals and personal care products (PPCPs) were detected in drinking water in the 1970s but in the 1990s, when male fish with androgynous sex organs were discovered, regulators took note. Numerous studies conclude that there are no short-term effects on human health; more studies need to be done. We can't stop taking our prescriptions but there are ways to minimize the impact on the environment from PPCPs. This *Tap The Power* focuses on what individuals and communities can do and provides some background on the issue and possible regulatory action.

"The Afterlife of Drugs and the Role of PharmEcovigilance" / Christian G. Daughton and Ilene Sue Ruhoy, *Drug Safety*, 2008, v.31, no.12, p. 1069-1082. (614.25/D26) A new term, pharmEcovigilance, encourages physicians to consider the consequences on patients and the environment when prescribing medications. Includes a diagram of the life cycle of a drug and considerable bibliography.

"Compounds of Emerging Concern: An Issue for Both Water and Wastewater Utilities" / Lorien J. Fono and H. Stephen McDonald, *Journal AWWA*, November 2008. Overview of the increased attention to CECs (compounds of emerging concern), research, regulation, and solutions, from a WWTP (wastewater treatment plant) perspective. [Available online on the Carollo Engineers Web site.] www.carollo.com/Pages/PLC162_CompoundsOfEmergingConcern_JAWWA.aspx

***Disposal by Flushing of Certain Unused Medicines: What You Should Know* / U.S. Food and Drug Administration. Last updated Sept. 17, 2010.** Includes a list, last updated March 2010, of specific medications that can be flushed down the sink or toilet. www.fda.gov/Drugs/ResourcesForYou/Consumers/BuyingUsingMedicineSafely/EnsuringSafeUseofMedicine/SafeDisposalofMedicines/ucm186187.htm

"Down the Drain: Addressing Pharmaceutical Disposal" / Wisconsin Counties, June 2007, p.22-31. (352.9/W75/2007/v.71/no.6) Articles: "Drugs in the Water: Does it Matter?"; "Jefferson County Launches Pharmaceutical Disposal Program"; "The Hurdles & Future of Pharmaceutical Collection Programs"; "Improper Disposal of Unused Medication Sparks Creation of New Awareness Program".

"Drugs in Our Waterways: What Community Leaders Can Do" / Michelle Moore and Sandra Fallon, *The Municipality*, August 2009, p.295-296. (352.1/M92/2009/v.104/no.8) Educate citizens, provide prescription take-back drop-off locations, allow safe disposal of medications in the trash, and encourage reducing the amount of personal care products used are suggested.

***Fact Sheet: Pharmaceuticals in Water* / Water Quality Association. September 2008.** Promotes home filtering systems as the best protection for drinking water.

www.wqa.org/pdf/pressreleases/pharmaceuticals.pdf

"Fish on Morphine: Protecting Wisconsin's Natural Resources Through a Comprehensive Plan for Proper Disposal of Pharmaceuticals" / Teirney Christenson, *Wisconsin Law Review*, 2008, no.1, p.141-179. (UW/Law/w/2008/no.1-3) (library use only) Proposes "a comprehensive regulatory scheme that will promote environmental stewardship while taking into account the concerns of all parties involved." (from the abstract)

***How to Dispose of Unused Medicines* / U.S. Food and Drug Administration. October 2009.** A 2-page consumer health information handout.

www.fda.gov/forconsumers/consumerupdates/ucm101653.htm

***Medication Waste Disposal Activities* / American Pharmacists Association. March 2009.** APhA's position on redistribution of previously dispensed medication and disposal of medications. Includes links to other resources. www.pharmacist.com/AM/Template.cfm?Section=Home2&CONTENTID=20036&TEMPLATE=/cm/ContentDisplay.cfm

"The Next Drug Problem" / Patricia Frank, *American City & County*, June 2007, v.122, no.6, p.32-35. (352.71/F85) Problems faced by water utilities from rising amounts of pharmaceutical compounds in surface water and drinking water.

"As Pharmaceutical Use Soars, Drugs Taint Water and Wildlife" / Sonia Shah, *Yale Environment 360*, April 15, 2010. An anti-inflammatory drug used in human and veterinary medicine has been linked to the rapid decline of the vulture population in India and Pakistan. Just one example of how pharmaceutical waste impacts the environment. http://e360.yale.edu/feature/as_pharmaceutical_use_soars_drugs_taint_water_and_wildlife/2263/

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Continued

Pharmaceuticals, Hormones, and Other Organic Wastewater Contaminants in U.S. Streams / U.S. Geological Survey. June 2002. A 2-page overview of a larger report. (Fact Sheet FS-027-02) <http://toxics.usgs.gov/pubs/FS-027-02>

“Pharmaceuticals in the Environment” / Jeffrey T. Sherer, *American Journal of Health-System Pharmacy*, January 15, 2006, v.63, no.2, p.174-178. (614.25/Sh5) Reviews a study in the U.S. on the presence of pharmaceuticals in the environment and the risk to humans.

Proposed Universal Waste Rule for Pharmaceuticals / U.S. Environmental Protection Agency. September 24, 2010. Would only apply to hospitals, dentist and physician offices, residential care facilities, veterinary clinics, etc. Limited to hazardous pharmaceutical wastes, definition provided. www.epa.gov/wastes/hazard/wastetypes/universal/pharm-rule.htm#content

A SWOT Analysis of Conducting Medication Disposal Programs in Wisconsin Communities / Christine Belland Maslonkowski, M.P.H. Thesis, UW-La Crosse. July 2009. (623.2/M37) SWOT (strengths, weaknesses, opportunities, threats) analysis of 1-day take-back events conducted by 35 communities in the La Crosse area; 96% survey response rate. <http://minds.wisconsin.edu/handle/1793/38653>

“Tons of Released Drugs Taint U.S. Water” / Jeff Donn, *U.S. News and World Report*, April 19, 2009. What does the federal government know and what is it doing about it. www.usnews.com/science/articles/2009/04/19/tons-of-released-drugs-taint-us-water.html?PageNr=1

Unused Pharmaceuticals in the Health Care Industry: Interim Report / U.S. Environmental Protection Agency. August 2008. Focuses on disposal of unused medicines by hospitals and long-term care facilities as a way to begin to understand how and why pharmaceuticals enter the water supply. EPA expects to expand the scope and range of this study. http://water.epa.gov/scitech/swguidance/ppcp/upload/2010_1_11_ppcp_hcioutreach.pdf

“Water Shortages: Is the United States Facing a Crisis?” / Congressional Quarterly, Inc., *CQ Researcher*, June 18, 2010, v.20, no.23. (622.2/C762c) A good overview of water issues, such as an aging infrastructure and bottled water. Includes a sidebar “Pharmaceutical Waste Winds Up in Water Supply.”

“What Are We Drinking?” / Jeff Donn, Martha Mendoza, and Justin Pritchard, *Indiana Gazette*, March 10-12, 2008, 3 parts. (614.25/D71) An Associated Press investigation that was published in three parts in newspapers across the country.

Related Web Sites

City of Burlington, Wisconsin – “Wastewater Treatment Process: Virtual Tour”: www.burlington-wi.gov/Departments/DPW/WaterSewer/wastewater_tour.htm Reclaimed solids, or sludge, is used by the agricultural community and treated water is discharged into the Fox River.

District of Columbia Water and Sewer Authority – “Blue Plains Virtual Plant Tour”: www.dcwasa.com/about/model_flash.cfm An interactive multimedia tour of DC Water’s Advanced Wastewater Treatment Plant (AWTP).

Illinois-Indiana Sea Grant College Program – “Disposal of Unwanted Medicines: A Resource for Action in Your Community”: www.iisgcp.org/unwantedmeds A series of toolkits to help communities, schools, and individuals develop medicine disposal programs.

Practice Greenhealth – “Pharmaceutical Waste Minimization”: <http://cms.h2e-online.org/ee/waste-reduction/waste-minimization/pharma> The audience for this Web site is the health care system (hospitals, clinics, etc.).

SMARxT Disposal – A Prescription for a Healthy Planet: www.smarxtdisposal.net Public-private partnership between the U.S. Fish and Wildlife Service, the American Pharmacists Association, and the Pharmaceutical Research and Manufacturers of America to educate consumers about how to dispose of medicines in a safe and environmentally protective manner.

Teleosis Institute – “Green Pharmacy Program”: www.teleosis.org/gpp-program.php To reduce pharmaceuticals from entering the environment.

U.S. Environmental Protection Agency – “Pharmaceuticals and Personal Care Products as Pollutants (PPCPs)”: www.epa.gov/ppcp Basic information, FAQs, and links to research area.

U.S. Environmental Protection Agency – “Pharmaceuticals and Personal Care Products (PPCPs) in Water”: <http://water.epa.gov/scitech/swguidance/ppcp/index.cfm> Includes links to other organizations and research areas.

U.S. Environmental Protection Agency – “Virtual Tour of a Drinking Water Plant”: <http://water.epa.gov/drink/tour> Target audience is children but a good introduction for everyone. Requires Adobe Flash.

UW-Extension Solid and Hazardous Waste Education Center – “Medicine Collection Event List”: www4.uwm.edu/shwec/events/viewEvents.cfm (select “Medicine Collection” from filter options)

Wisconsin Department of Natural Resources – “Donating Medical Items”: <http://dnr.wi.gov/org/aw/wm/medinf/donate.htm> Includes medicines, personal care products, and medical equipment. List of organizations that accept donations also available.

Wisconsin Department of Natural Resources – “Pharmaceutical Waste: Overview”: <http://dnr.wi.gov/org/aw/wm/pharm/pharm.htm> Good place to start for answers to questions about what Wisconsin is doing.